From: Mark Hydeman
To: Mark Cherniack
Sent: Friday, June 29, 2007 2:35pm

Mark C

I should have separated my comments on the installed costs between the two proposals. As I recall there was no estimate on the VAV proposal. Either way the RTU numbers are quite optimistic ($1,000 ~= 10 hours).

Mike Brambly can assert what he wants, but I have seen no reliable research on which we can base the savings numbers. I have great respect for their work but I adopt a Missouri "show me" attitude when I hear reported savings.

I really think that we need a simple set of acceptance tests that indicate that the AFDD in fact is operating correctly. For the near term you want successful implementations and not a bunch of smoking wrecks along the side of the road. A few bad jobs could undermine long term implementation of these technologies.

- Mark H

Mark Hydeman, P.E., FASHRAE
Principal Taylor Engineering, LLC

From: Mark Cherniack
Sent: Friday, June 29, 2007 12:56 PM
To: Mark Hydeman
Subject: Re: 2008 Building Energy Efficiency Standards Comments on AFDD Compliance Options Proposals
Importance: High

Mark: Hey, thanks for jumping in. I expected it and was waiting to see your comments. I know you are supportive and we have to keep FDD moving on a reasonable basis. As you know we have some follow on action from the Roundtable. Thanks for sending Reinhard. He's taken the interest in FDD data standards and the visualization topic and run with both of them.
Your comment #7 was a bit off: the $ figures given were not for AHU/VAV FDD, only for the unitary equipment diagnostics. The derating issue is a crap shoot given how buildings currently perform. Mike Brambley is confidently asserting 15-30% energy savings potential with FDD. That seems more indicative of the magnitude of derating for the presence or absence of FDD. Although over time, with FDD, the potential for additional savings goes down since one is at least theoretically, maintaining higher performance all of the time and operating the building at the expected baseline.
Regards..Mark

Mark Cherniack
Senior Program Manager
New Buildings Institute

From: Mark Hydeman
To: Jeff Schein
Sent: Friday, June 29, 2007 2:25pm

Jeff:

Actually the feedback that I got from Enovity was that the tuning had to do with the deviation from setpoint before a fault was logged. It was a non-trivial task to get it right. I do agree that some of this stuff will get settled out over time but I am unaware of any implementation of your algorithms in which you haven't been directly involved in helping them set this up and/or tune it. Clearly this will change over time, but the AFDD industry is still relatively new, thus the reason for a compliance option.

You should know that I have been presenting your concepts in the majority of my control classes, I am a true believer, but we need to move slowly in the standard's arena when we introduce new technologies.

Mark Hydeman, P.E., FASHRAE
Principal Taylor Engineering, LLC

-----Original Message-----
From: Jeff Schein
Sent: Friday, June 29, 2007 1:57 PM
To: Mark Hydeman
Subject: Re: 2008 Building Energy Efficiency Standards Comments on AFDD Compliance Options Proposals

Mark,

Thank you for the insightful comments. However, I am troubled by your characterization of the tuning requirements for AFDD based on your experience with the 450 Golden Gate building. The current set of default parameters for the AFDD algorithm were developed at several sites including 450 Golden Gate, so the experience at that site is not a typical installation of AFDD in a building.
Before the parameters were tuned at 450 Golden Gate, there were a lot of false alarms but the tuning process was part of a research project, not something to be repeated every time AFDD is installed in a building. The default parameters have subsequently been used, successfully, in several other buildings - without any tuning. See the table at the end of the "Bibliography and Other Research" section of "Title 24 AHU VAV FDD.doc".

Also, the current reported 90% accuracy rate needs to be considered with the understanding that many of the "false alarms" are actually real faults caused by failures in another piece of equipment. For example, a VAV box fault is reported when the drive belt of the supply fan in the serving AHU breaks. The owner of the building, the U.S. General Services Administration Region IX, was satisfied with the AFDD algorithm to the extent that the owner's computerized maintenance management system polls the control system for AFDD fault status and automatically generates a work order when AFDD indicates a fault. The owner has also decided to install the AFDD algorithm at several other buildings.

Jeffrey Schein, P.E.
National Institute of Standards and Technology 100 Bureau Drive MS 8631

Quoting Mark Hydeman <mhydeman@taylor-engineering.com>:

> Dear Mazi, Chris et all:

>
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>
> Attached is my review of the AFDD compliance option proposals from
> Martyn Dodd of Energy Soft, LLC. As you can see I am supportive of
> providing AFDD with credit as a compliance option but I feel that
> several issues need to be addressed:
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> *   The credit needs to be adjusted (lowered) for the Title 24 2005
> Acceptance Tests to prevent double dipping
> *   The derating needs to be limited in its application to applying
> a credit for AFDD otherwise all of the other measures will show
> increased savings with no changes
> *   The AFDD systems need corresponding Acceptance Tests to ensure
> that they have been sufficiently tuned (these are far from plug and
> play at present)
> *   The changes should include underlines and strikeouts so that it
> is clear what is changing
>
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>
> I look forward to your responses to my comments.
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>
> - Mark
>
> Mark Hydeman, P.E., FASHRAE
> Principal Taylor Engineering, LLC
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> _____
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> From: Kristin Heinemeier
> Sent: Tuesday, June 19, 2007 2:47 PM
> Subject: Title 24 Diagnostic Proposals for Review
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> From Mark Cherniack:
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> To FDD Roundtable Invitees: Attached are the two diagnostics
proposals
> submitted to California Title 24 2008 revision process for review and
> comment. Comments to CEC due: June 29
>
> Those submitting comments by electronic mail should provide them on
> letterhead in either Microsoft Word or Portable Document Format (PDF)
> to XXXXXXXXX.XXX. Please include "2008 Building Energy
> Efficiency Standards [suggestions] or [comments]" in the subject line
> and first paragraph of your comments. Interested persons may also
send

> comments by postal mail. Please hand deliver or mail the original and
> 10 copies of the comments to:
>
> Chris Gekas
> California Energy Commission
> 1516 Ninth Street, MS 25
> Sacramento, CA 95814-5512
>
> Please include your name, organization, and contact information. All
> written materials related to this workshop will become part of the
> public record. For questions, please contact Chris Gekas, at (916)
> 654-8435, or Mazi Shirakh, Senior Mechanical Engineer, at
> (916) 654-3839, by e-mail at xxxxxxxx.xxx.
>
> Please take the time to look over the proposals. Recall that the
> genesis of the two proposals was from a CEC review of PIER program
> activities (circa 2005-06) to determine what projects, if any, would
> be appropriate for consideration in the Title 24 Standards. These two
> proposals were submitted over a year ago, recently revised and
> submitted last week. The attached RTU Calibration spreadsheet is part
> of the analysis of the impact of RTU FDD for purposes of establishing
> the benefits of FDD in terms of reduced degradation of expected
efficiency.
>
> The two proposals are being reviewed by CEC as Compliance Options,
not
> requirements. Acceptance criteria have been proposed along with the
> specific diagnostic measures. Feel free to support, oppose (?),
and/or
> suggest helpful revisions if there is something that you think needs
> clarifying or revising. Feel free to send a copy of your comments to
> me. This will enable useful negotiations with CEC staff if needed for
> the final language that will be released for public comment at some
> point in October or November 2007. These two options should be
> reviewed as subjects for case studies/performance demonstration
> projects that may come about as a result of the FDD Roundtable June
> 14. The raw materials and a summary of the Roundtable will be sent to
> all shortly as a reminder of what was achieved and what still remains
> to address. Thanks for your time and attention on this historic
> opportunity for recognition of these two approaches to fault
detection and diagnostics. Regards....
> Mark
>
> Mark Cherniack
>